Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Increasing severity of COVID-19 in pregnancy with Delta (B.1.617.2) variant surge

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Objective

The Delta (B.1.617.2) variant became the predominant SARS-CoV-2 virus circulating in the United States beginning June-July 2021.[1] We report illness severity trends among obstetric patients with COVID-19 in a background of Delta variant predominance and describe COVID-19 vaccinations in this cohort at Parkland Hospital, a public county hospital.

Study Design

We prospectively studied pregnant patients diagnosed with SARS-CoV-2 by nasal or nasopharyngeal PCR in a large prenatal system encompassing a centralized acute care hospital and 10 community-based prenatal clinics, all with an integrated electronic health record. In mid-May 2020, universal SARS-COV-2 screening was implemented for obstetric patients on hospital admission, with symptom-based testing at outpatient clinics and the emergency department. Positive tests were grouped into weekly epochs by date of diagnosis and maximum symptom severity. Severe or critical illness was defined as requiring supplemental oxygen, high-flow nasal cannula, ICU admission, or mechanical ventilation. Management of asymptomatic or mild to moderate illness in pregnancy included symptom treatment with isolation precautions and virtual or in-person follow up. Routine management of severe or critical illness included administration of dexamethasone or other therapies according to NIH guidance.[2] The association between severe or critical illness and week was evaluated for trend using the Mantel-Haenszel chi-squared test for trend. Local SARS-CoV-2 Delta variant (B.1.617.2) sequencing was performed and variant predominance tracked weekly. COVID-19 vaccines were offered from December 2020, and vaccination rates in pregnancy or immediately postpartum are described.

Results

From May 17, 2020 through September 4, 2021, 1,515 pregnant patients were diagnosed with COVID-19, and 7(0.5%) had reinfection >90 days after initial infection during pregnancy. Infections included 690(45%) from Labor and Delivery or inpatient units, 383(25%) outpatient, 167(11%) emergency department, and 282(19%) external tests. Included are 82(5.4%) with severe or critical illness during pregnancy, with 10(0.7%) requiring mechanical ventilation, 2(0.1%) maternal deaths whose neonates survived, and 2(0.1%) fetal-neonatal deaths associated with maternal critical illness.

The proportion of pregnant patients with severe to critical illness increased in April 2021 although total case numbers remained low (Figure). As Delta (B.1.617.2) variant predominated locally, both the case volume and the proportion of severe or critical illness increased significantly (p=0.001 for trend), with over a quarter of pregnant patients diagnosed between August 29-September 4 admitted for severe or critical illness.

COVID-19 vaccine administration with any vaccine authorized for emergency use was examined in this cohort. Among 665 patients still pregnant or immediately postpartum when vaccines were available, 142(21.4%) received at least one dose of an available vaccine, including 39 before infection, 99 after, and 4 between repeat infections. One infected patient was hospitalized for severe COVID-19 after being vaccinated; this patient had a BMI of 61kg/m^2.

Conclusion

There is increased morbidity seen in pregnancy with COVID-19 during the recent surge associated with the Delta variant, particularly in an underserved pregnant population where vaccine acceptance is low.[3] Overall rates of severe or critical illness in this cohort are consistent

with previously published data from our institution.[4] However, recent trends demonstrate that along with increasing case volume, the proportion requiring hospitalization is rising. Potential pathophysiologic mechanisms for increased severity of illness with B.1.617.2 in pregnancy are unclear. Our results highlight the urgency of prevention measures including COVID-19 vaccination during pregnancy.

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References

1. Centers for Disease Control and Prevention COVID Data Tracker: Variant Proportions. Available at https://covid.cdc.gov/covid-data-tracker/?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcases-updates%2Fvariant-proportions.html#variant-proportions. Accessed September 2, 2021.
2. COVID-19 Treatment Guidelines Panel. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. National Institutes of Health. Available at https://www.covid19treatmentguidelines.nih.gov/. Accessed August 31, 2021.
3. Razzaghi H, Meghani M, Pingali C, et al. COVID-19 Vaccination Coverage Among Pregnant Women During Pregnancy — Eight Integrated Health Care Organizations, United States, December 14, 2020–May 8, 2021. MMWR Morb Mortal Wkly Rep 2021;70:895–899.
4. Adhikari EH, Moreno W, Zofkie AC, et al. Pregnancy outcomes among women with and without severe acute respiratory syndrome Coronavirus 2 infection. JAMA Netw Open 2020; 3(11): e2029256.

112 **Figure Legend**

113 **Figure 1. Panel A,** Weekly cases and percent severe or critical COVID-19 illness in pregnancy at
114 an Parkland Hospital, May 17, 2020 - September 4, 2021. Data after dotted line considered
115 preliminary. Delta (B.1.617.2) variant predominance shown in blue; the last week includes
116 sequencing through August 30. **Panel B,** Locally weighted smoothing scatterplot (LOESS) of
117 percent severe or critical COVID-19 illness in pregnancy with 95% confidence interval (CI) shown
118 (p=0.001 for trend), May 17, 2020 – September 4, 2021.
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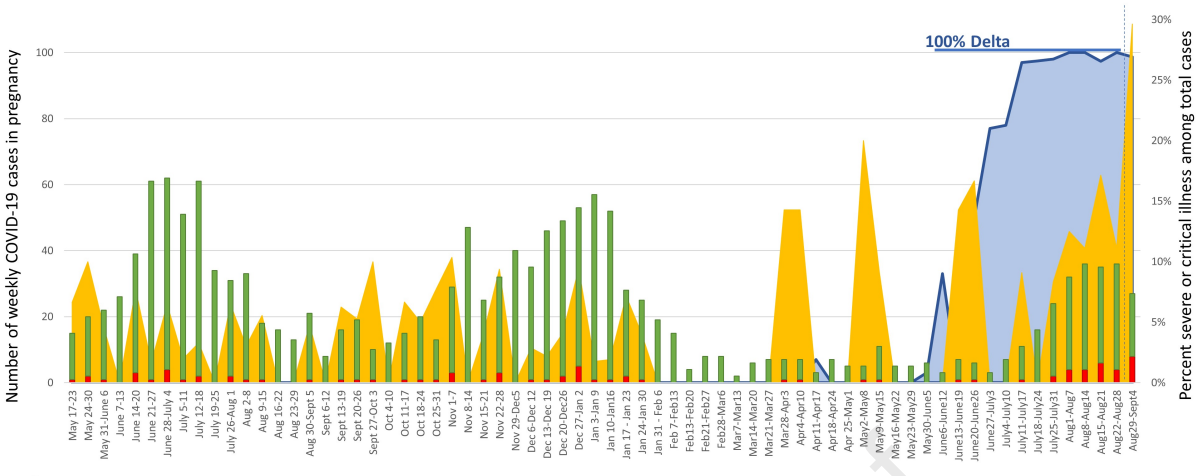

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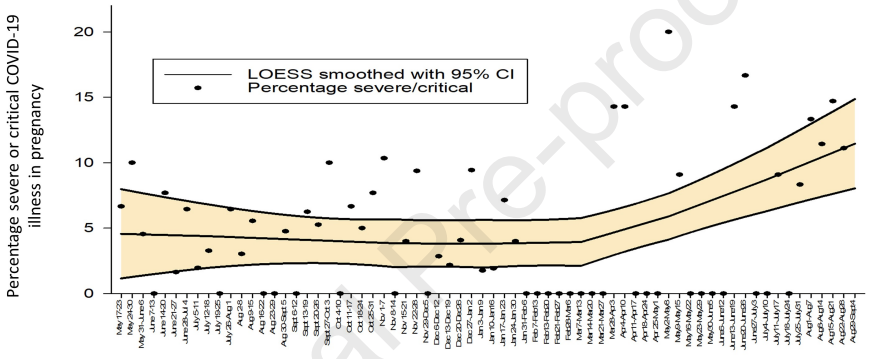

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